

What is claimed is:

Sub 1. A transceiver-processor building block for an
 2 electronic radio system multifunction slice, the building
 3 block comprising:

4 a plurality of transceivers;

5 a processor coupled to the transceivers;

6 a local RF control bus inaccessible directly from
 7 outside the multifunction slice and coupled between the
 8 processor and the transceivers;

9 a radio network bus coupled to the processor; and

10 a radio network bus connector coupled to the radio
 11 network bus to provide direct accessibility to the radio
 12 network bus from outside the multifunction slice.

2. The building block of claim 1, further comprising
 2 an external control bus coupled to the processor and an
 3 external control bus connector providing direct accessibility
 4 to the external control bus from outside the multifunction
 5 slice.

1 3. The building block of claim 2, wherein the external
2 control bus carries antenna configuration data.

1 4. The building block of claim 2, wherein the external
2 control bus carries antenna interferometer configuration data
3 and beam forming data.

1 5. The building block of claim 4, wherein the radio
2 network bus transfers transmission coordination data and
3 voice and user data into and out of the building block.

1 6. The building block of claim 5, wherein the local RF
2 control bus carries tuning data for the plurality of
3 transceivers.

1 7. The building block of claim 6, wherein the local RF
2 control bus carries intermediate frequency bandwidth
3 information and intermediate frequency gain characteristics
4 for the plurality of transceivers.

1 8. The building block of claim 1, wherein the radio
2 network bus carries unencrypted information and is isolated
3 from the local RF control bus.

1 9. The building block of claim 4, wherein the radio
2 network bus is isolated from the local RF control bus with
3 electromagnetic shielding.

1 10. The building block of claim 1, wherein the
2 processor includes encryption and decryption support for each
3 transceiver in the plurality of transceivers.

1 11. The building block of claim 1, wherein the
2 processor includes multilevel security software to control
3 routing of data.

1 12. The building block of claim 1, further comprising
2 encryption and decryption support circuitry coupled to the
3 processor for each transceiver in the plurality of
4 transceivers.

1 13. The building block of claim 1, wherein the local RF
2 control bus carries control data from the processor to the
3 transceivers.

1 14. An electronic radio system multifunction slice for
2 supporting a predetermined number of communication threads,
3 the multifunction slice comprising:

4 an RF aperture switch/transmitter interface;

5 a plurality of transceivers coupled to the RF aperture
6 switch/transmitter interface;

7 a processor coupled to the transceivers;

8 a local RF control bus inaccessible directly from
9 outside the multifunction slice and coupled between the
10 processor, the transceivers, and the RF aperture/transmitter
11 interface;

12 a radio network bus coupled to the processor;

13 a radio network bus connector coupled to the radio
14 network bus to provide direct accessibility to the radio
15 network bus from outside the multifunction slice; and

16 an avionics interface coupled to the processor, the
17 avionics interface providing a core avionics network output
18 and a core avionics network input.

1 15. The electronic radio slice of claim 14, further
2 comprising an external control bus coupled to the processor
3 and an external control bus connector providing direct
4 accessibility to the external control bus from outside
5 the multifunction slice.

1 16. The electronic radio slice of claim 14, wherein the
2 local RF control bus is restricted to carrying control data
3 information between the processor, the transceivers, and the
4 RF aperture switch/transmitter interface.

1 17. The electronic radio slice of claim 14, wherein the
2 radio network bus carries unencrypted information and is
3 isolated from the local RF control bus.

1 18. The electronic radio slice of claim 17, wherein the
2 radio network bus transfers transmission coordination data
3 and voice and user data into and out of the building block,
4 the local RF control bus carries tuning data for the
5 plurality of transceivers, and the external control bus
6 carries antenna configuration data.

1 19. A method for operating a transceiver-processor
2 building block in an electronic radio system multifunction
3 slice, the method comprising:

4 providing a plurality of transceivers coupled to a
5 processor;

6 communicating unencrypted data to the processor over a
7 radio network bus coupled to the processor, the radio network
8 bus coupled to a radio network bus connector providing direct

9 accessibility to the radio network bus from outside the
10 multifunction slice;

11 processing the unencrypted data to form encrypted user
12 data and control data;

13 processing the encrypted data to form unencrypted user
14 data and processing the data to form control data; and

15 communicating the control data to the transceivers over
16 a local RF control bus between the processor and the
17 transceivers, the local RF control bus inaccessible directly
18 from outside the multifunction slice, and communicating the
19 user data to the transceivers over bi-directional baseband
20 interfaces.

1 20. The method of claim 19, further comprising the step
2 of communicating antenna configuration data over an external
3 control bus coupled to the local RF control bus to an antenna
4 outside the multifunction slice.

1 21. The method of claim 19, further comprising the step
2 of electrically isolating the network bus from the local RF
3 control bus.

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